

CLAIMS

What is claimed is:

1 1. A circuit board apparatus comprising:
2 a semiconductor package defined by a substrate having a matrix of conductive contact pads
3 on both the top and bottom surfaces of the substrate; and
4 two interposers for receiving said semiconductor package, the interposer defined by a body
5 having a matrix of interposer contact bumps on both the inner and outer surfaces of the body, each
6 interposer contact bump comprising an electrically conductive path and shaped to abut a contact
7 pad of said semiconductor package and contact pads of said PCB.

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3 2. The apparatus of claim 1 wherein the contact pads of the semiconductor package are
uniformly spaced.

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5 3. The apparatus of claim 1 wherein the semiconductor package is a land grid array package.

6
7 4. The apparatus of claim 1 wherein the contact pads of the interposer are uniformly spaced.

1 5. The apparatus of claim 1 wherein the contact pads on the top surface of the semiconductor
2 package support debugging and test operations.

1 6. The apparatus of claim 5 wherein the contact pads on the bottom surface of the
2 semiconductor package are designated for production operations.

1 7. The apparatus of claim 1 wherein the number of interposer contact pads on the inner
2 surface of the interposer exceeds the number of contact pads on the top surface of the
3 semiconductor package.

1 8. The apparatus of claim 1 wherein the interposer contact pads on the inner surface of the
2 interposer are arranged in the same pattern, pitch and spacing as the contact pads on the top
3 surface of the semiconductor package.

1 9. The apparatus of claim 8 wherein the semiconductor contact pads have a 1.27 mm pitch or
2 smaller.

10. The apparatus of claim 1 wherein the substrate supports 1443 signals to be collected.

11. A circuit board apparatus comprising:
1 a semiconductor package defined by a substrate having a matrix of conductive contact pads
2 on both the top and bottom surfaces of the substrate;
3 an interposer for receiving said semiconductor package, the interposer defined by a body
4 having a matrix of interposer contact pads on both the inner and outer surfaces of the body, each
5 interposer contact pad comprising a metal coating and shaped to abut a contact pad of said
6 semiconductor package;
7 a heat sink for absorbing or dissipating any excess heat generated by said semiconductor
8 package; and
9 a gasket for providing sufficient force to the apparatus.

1 12. The apparatus of claim 11 wherein the gasket comprises a sponge.

1 13. The apparatus of claim 12 wherein the gasket comprises a silicon sponge.

1 14. The apparatus of claim 13 wherein the gasket comprises a Young's modulus in the range of
2 100 to 200 kpsi.

1 15. The apparatus of claim 14 wherein the gasket behaves elastically up to 50% compression.

1 16. The apparatus of claim 11 wherein the gasket has a width of 0.150 inches and a height of
2 0.125 to 0.1875 inches.

1 17. The apparatus of claim 16 wherein the gasket is compressed approximately 20 to 40% of its
2 original height when the apparatus is fully assembled.

1 18. A processor comprising a substrate having a matrix of conductive contact pads on the
2 bottom surface of the substrate and a test port on the top surface of the substrate.

1 19. The processor of claim 18 wherein the test port comprises a conductive contact pad.

1 20. The processor of claim 18 wherein the test port is designated for debugging and test
2 operations.

1 21. The processor of claim 18 wherein the contact pads on the bottom surface of the processor
2 are designated for production operations.

1 22. The processor of claim 18 wherein the test port on the top surface of the substrate possesses
2 approximately the same contact density as the contact pads on the bottom surface of the substrate.

1 23. The processor of claim 18 wherein the test port on the top surface of the substrate possesses
2 approximately the same signal integrity as the contact pads on the bottom surface of the substrate.

1 24. The processor of claim 18 wherein the test port on the top surface of the substrate possesses
2 approximately the same reliability as the contact pads on the bottom surface of the substrate.